I may perhaps be allowed to mention that neither the British Rainfall Organisation nor I personally have any financial interest in any rain-measuring appliances, and we thus retain perfect freedom for the helpful criticism of all such instruments.

Hugh Robert Mill.

INSECT PESTS AND WAR.[1]

War is associated in the popular mind with the summoning of armies, the thunder of the guns, and the carnage of blood-stained battlefields. Patriotism is manifested in personal sacrifice in many directions, some public, many unsuspected. All cannot help in the direct attack on our enemies, but all are able to assist in preventing disease that plays so important a part in the progress of a campaign. Horrible as are the features of any war, times arise when the destructive "minor horrors," or insect pests, that are the inevitable accompaniment of the concentration of large numbers of men, assume a major import. The victims of the typhus now ravaging Serbia know this only too well. It is, then, a patriotic action on the part of Dr. Shipley to have set forth the life-histories of many noxious and disease-carrying arthropods, as well as certain leeches, together with very practical hints as to their prevention, in his book, "The Minor Horrors of War."

At the present time there is an undoubted need for the dissemination of knowledge regarding the *rôle* of various pests, both insect and others, in a simple yet practical form. The advantage is considerably increased when the information is presented in a lucid manner, with numerous illustrations, and in a style that may perhaps be best described as fully human. The accounts of the habits of lice, bugs, fleas, flies, mites, ticks, and leeches, which all have a share in injuring man, are set forth in a form that arrests the attention, stimulates personal interest, and, at the same time, by humorous interludes, neither repels nor disgusts the reader. The practical side, as before mentioned, is kept in view throughout.

Lice undoubtedly are unpleasant, but to ignore their existence does not minimise the danger arising from their presence. At least two diseases that are known to occur in certain areas of the present war zone are transmitted by lice (Fig. 1). Relapsing fever is due to a spirochæte that develops in the body-louse. The spirochæte reaches man when, in his endeavour to alleviate the irritation due to the insect, he scratches his skin. Simultaneously, he crushes one or more of the unwelcome insects, and spirochætes are unwittingly rubbed into the slightly damaged skin. Troops operating in Africa understand how easy it is to touch the eyes to remove sand or dust, and a finger soiled by a crushed louse has been shown to convey relapsing fever when so used. Typhus fever also is spread by lice, and there is no need to dwell on the fearful rapidity with which this fell disease may spread.

It must be remembered that the irritation of the body due to insect pests reacts on the mind, and is manifested in mental restlessness and lowered spirits. The clearly expressed preventive measures recommended against lice will doubtless be appreciated during the present campaign.

Bugs are very undesirable intruders in houses, and troops operating in India and Persia have reason to fear their attentions. Ticks occur in the Eastern theatre of war, and also in African territory where other troops are engaged. One tick, *Ornithodorus moubata,* transmits *Spirochaeta duttoni,* the cause of a more severe form of relapsing fever. The young tick is unlike the adult, and being so much smaller, is more easily overlooked, and is therefore more dangerous, especially as it may be born infected. Knowledge of its life-history, as set forth by Dr. Shipley, is important.

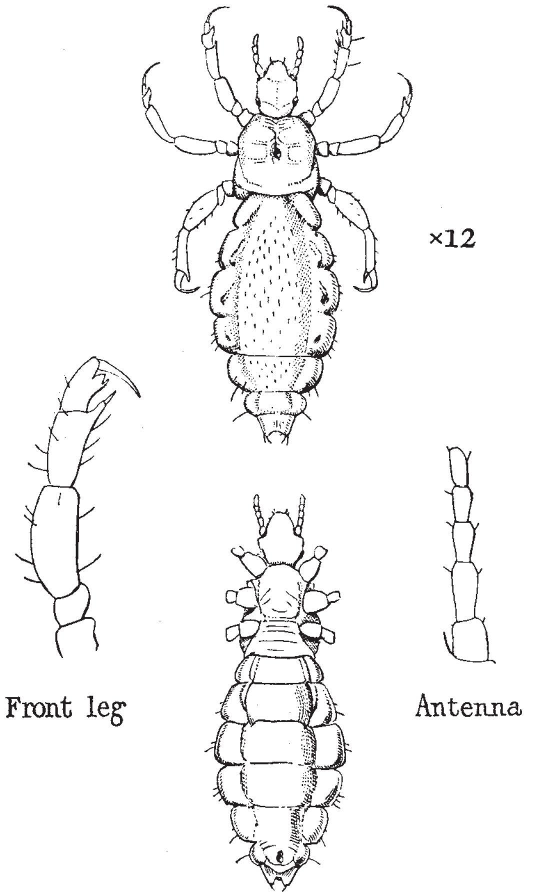

Fig. 1.—*Pediculus vestimenti.* The louse. Dorsal and ventral views. From "The Minor Horrors of War."

Mites are small relatives of ticks, and those that infest man are often known to soldiers and field-workers by the name of harvest mites. The habits of these small pests, as well as those of the "itch insect," together with the modes of dislodging them, are facts that should be better

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[1] "The Minor Horrors of War." By Dr. A. E. Shipley. Pp. xvii+166. (London: Smith, Elder and Co., 1915.) Price 1*s*. 6*d*. net in paper covers, 2*s*. net in cloth.

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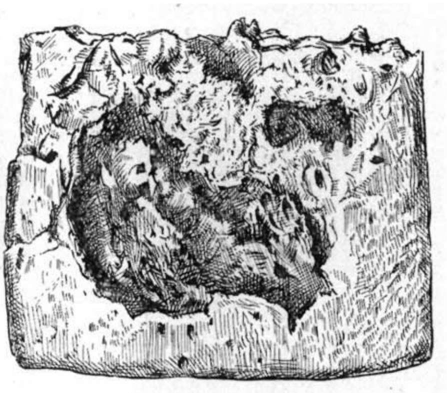
known. Fleas, too, need attention. The dreaded plague is spread by means of infected rat-fleas that leave their natural host and pass to man. Fleas also convey other diseases, and apart from this, the broken rest due to flea-bites is a factor that makes even such an insignificant insect worthy of consideration.

Blood-sucking leeches occur in Belgium and Germany, and also in parts of India, Ceylon, Egypt, and Palestine. These animals, although not belonging to the arthropoda, constitute a very real pest in some places, as they may occur in drinking water. The straining or filtering of drinking water and boiling it before use are simple means of avoiding distressing throat and lung troubles. The existence of voracious Indian land leeches, lurking among foliage in wait for their prey, will probably be news to many, but provides a useful hint with regard to sites for camping.



[illegible]
From "The Minor Horrors of War."

Man is affected by insect parasites not only through direct attacks upon himself, but also by infestation of his dwellings and his food. Flies and flour moths are therefore discussed. Fortunately, the occurrence of "maggotty" biscuit (Fig. 2) is not so common as formerly, but the possibility of its recurrence under war conditions should be remembered. Flies are a more serious pest. House-flies are concerned with the conveyance of several diseases to man, typhoid fever perhaps being the best known. The typhoid bacilli can live for six days in the intestine of a house-fly, and food and milk can be polluted by its promiscuous visits during this period (Fig. 3). Insight into the life-history and habits of flies is sufficient to cause anyone to join in the anti-fly crusade. The love of filth and carrion displayed by the various blow-flies or meat-flies, too, is a means of spreading disease, and there are records, even in the present war, of wounded men suffering agony from the presence of fly larvæ in their neglected wounds. The abolition of filth is the simplest means of securing freedom from flies by destroying their breeding places.

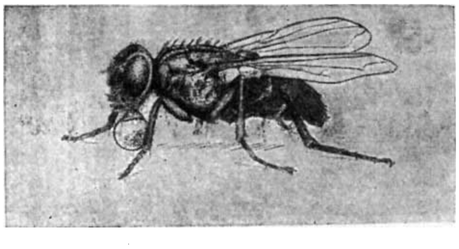


Fig. 3.—*Musca domestica*, the house-fly, in the act of regurgitating food. ×4½ (After Gordon Hewitt.) From "The Minor Horrors of War."

The relation of insect pests to the health of men and animals is a subject of interest to all, and it is not surprising that the large first edition of Dr. Shipley's book was practically exhausted in a month, and that a second edition is in preparation. The combination of literary charm and scientific information of practical utility, particularly at the present time, is certain to ensure its continued success.

H. B. Fantham.

THE SUPPLY OF OPTICAL GLASS.

THE serious position in which this country was placed at the outbreak of hostilities by the almost complete stoppage of the supply of optical glass and of the import of optical instruments, is at last attracting the attention of the public which should have been much sooner focussed upon it. The importance of the subject was early recognised by the British Science Guild, which referred its consideration to its Technical Optics Committee. This committee, after fully investigating the evidence then available, reported, and the guild forwarded an important report to the Board of Trade; the report was printed in full in our issue of March 25 (page 104). So far as can be ascertained, however, no official action appears to have resulted.

Quite recently, Sir Philip Magnus, the member for the University of London, put on the order paper of the House of Commons questions addressed to the representatives of the War Office and the Admiralty, asking whether the supply of optical glass and optical instruments for the use of the Services was keeping pace with their immediate requirements. To these questions official replies of the stereotyped order were given and, in addition, the representative of the Admiralty informed the House that a large firm of makers of optical glass in this country "had greatly increased their output and were still adding to their plant." Before these replies were given, a long letter on the subject was published in the *Times* over the signature of Dr. Walmsley, the Principal of the Northampton Polytechnic Institute, an institute which is intimately associated with technical instruction in applied optics. There had also been other allusions to the matter in the Press.

In the report of the British Science Guild, referred to above, the main points involved are clearly indicated; and with regard to the supply of optical glass for instruments required by the Government, the report states that at the time of its issue there seemed to be no call for any special

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